HINZ
A Rockwell Automation Company

Amoco Canada Petroleum Company
Cochin Pipeline Control System Overview

The Client:

Amoco Canada Petroleum Company Ltd. operates the Cochin Pipeline on behalf of Dow Chemicals of Canada Ltd., NOVA Corporation of Alberta, Petro-Canada Inc., and Shell Canada Ltd. The pipeline consists of approximately 3000 km (1900 miles) of 30 cm (12") pipe. The system ships products from Fort Saskatchewan, just outside of Edmonton, Canada, then continues through Alberta, Saskatchewan, North Dakota, Minnesota, Iowa, Illinois, Michigan, ending in Windsor and Sarnia. The pipeline is designed to transport light hydrocarbon liquids, primarily ethane, propane, ethylene, butane and NGLs. The system has 31 pumping stations located at line spacing of approximately 100 km (60 miles), 5 propane terminals, and 8 injection/delivery terminals.

The Requirement:

The original SCADA control system was installed in the late 1970s. Due to obsolete equipment, it was decided to upgrade the existing control system to current technology.

The primary goals of the Cochin pipeline control system upgrade were to provide a state of the art information system that:

- Provides real time pipeline information for making sound business operating decisions
- Provides system-wide accessibility for various users of data via a leading edge technology communication system
- Minimizes data duplications and the amount of paper traffic
- Utilizes industry standard hardware and software products that are readily available, widely supported, modular, and expandable

The Design Solution:

Hinz was contracted by Amoco Canada to provide engineering and integration services for the project. The contract included project management of a $10 million capital expenditure, detail engineering, equipment procurement, implementation, documentation, construction supervision, and commissioning.

The first phase of the project consisted of performing a requirements and technology analysis, then developing a design basis, execution plan, and specifications for all subsystems of the overall control system (refer to system overview drawing on the next page). For execution, the project was split into a Field Systems Team and Master Systems Team. Both teams used a structured teamwork approach with client and vendor participation in the design teams.

The system has integrated a number of different products into a seamless SCADA and information management system. Master SCADA and Field SCADA are the same system which provides a common operational environment throughout the pipeline. The pipeline modeling system (for leak detection and batch tracking) is integrated with the SCADA real time database and RDBMs. The propane terminals utilize the same RDBM system as SCADA and provides commonality with the business applications group.

Communications utilized standard X.25 network protocol. Internet protocol is layered on X.25 to provide inter-connectivity across the entire pipeline. This provides a wide-area network that enables operational and business units to access real time, historical and forecast data on the Cochin Pipeline.

The remote facilities are controlled by PLCs configured for stand-alone operation. Custody transfer measurement is performed by flow computers. The flow computers and PLCs pass serial data to a workstation running the SCADA software which acts as the local operator interface for the facility and formats the data on a report by exception basis to the SCADA master.

- Daniel Flow Computers
- GE Fanuc series 90-70 PLCs with Co-Pro Modules

The subsystems consisted of:

Field System Team

- Station instrumentation modification
- Station PLC controllers and software
- Station Data Concentrator/MMI Station
  - The workstation software for propane terminals, pump stations, etc. are from the master computer
- Construction

Master System Team

- Master SCADA computer and software (disaster recovery, redundancy)
- VSAT Satellite Communications Subsystem
- Real timepipeline modeling software (for leak detection, batch tracking and power optimization)
- Relational database interface for business applications (for scheduling, ticketing, and accounting interface)

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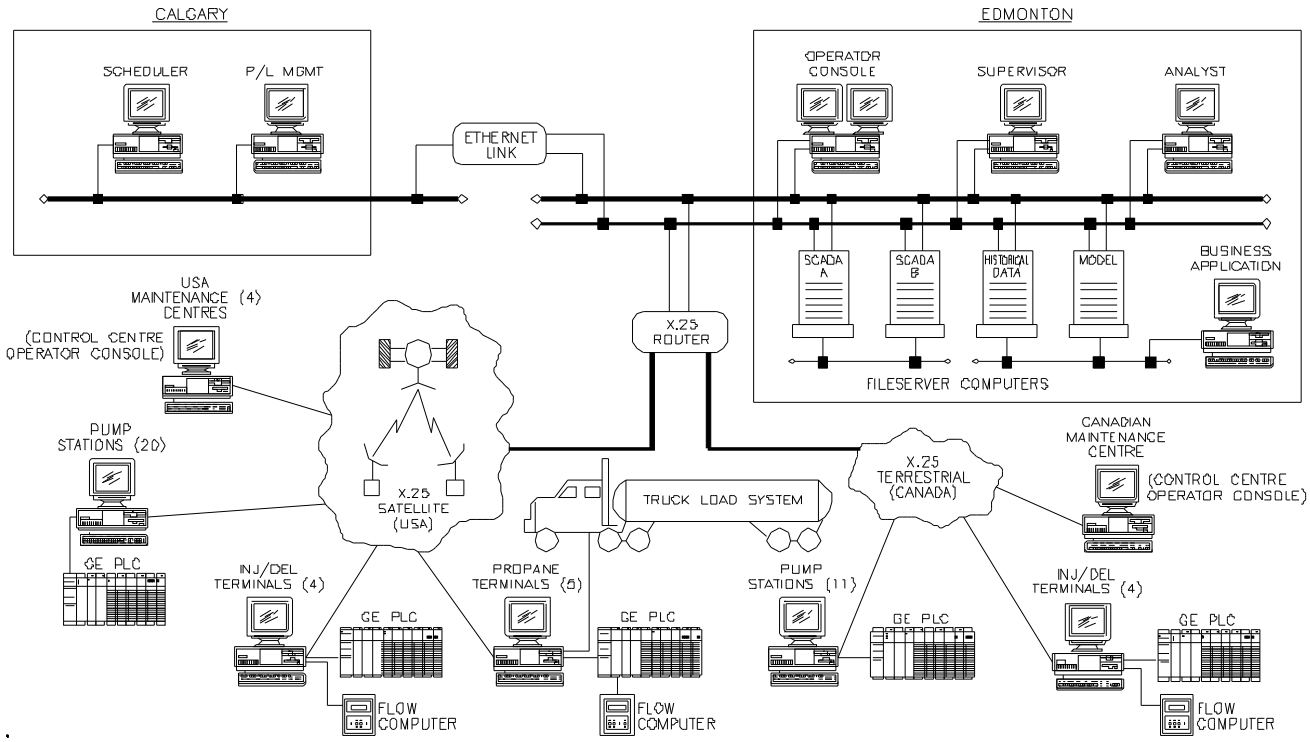

System Specifications:

- •Daniel Flow Computers•
- GE Fanuc series 90-70 PLCs with Co-Pro Modules
- Interface to Allen-Bradley PLCs
- SUN Workstations with Optical Media
- Open Client/Server Architecture
- Local Area Network Technology
- Interface to Applied Automation Gas Chromatograph
- SUN UNIX Operating System
- Valmet OASyS SCADA Software
- Satellite Communications System (VSAT)
- X.25 Communications Protocol
- Truck loading system
- Sybase Relational Database Management System
- Real Time Transient Pipeline Model Software
- Power optimization Software

For further information or to contact a Hinz office near you, please check our website at:

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